

CLAIMS

What is claimed is:

1. An aqueous coating formulation containing solids, for enhancing image visualization and retention of acid dye-based inks, comprising:
 - a) a cationic polymer or copolymer,
 - b) a fabric softener,
 - c) urea, and
 - d) ammonium oxalate.
2. The aqueous coating formulation of claim 1 wherein said cationic polymer or copolymer is present in an amount between about 5 to 95% of the total solids.
3. The aqueous coating formulation of claim 1 wherein said fabric softener is present in an amount between about 5 to 20% of the total solids.
4. The aqueous coating formulation of claim 1 further comprising a latex binder.
5. The aqueous coating formulation of claim 4 wherein said latex binder is present in an amount between about 0 to 80% of the total solids.
6. The aqueous coating formulation of claim 1 wherein the urea is present in an amount between about 2 and 5% of the total solids.
7. The aqueous coating formulation of claim 1 wherein the ammonium oxalate is present in an amount between about 5 and 10% of the total solids.
8. The aqueous coating formulation of claim 1 further including additives selected from the group including wetting agents, defoamers, and surfactants.
9. The aqueous coating formulation of claim 1 further including at least one tanning agent.

10. The aqueous coating formulation of claim 9 wherein said tanning agent is either ethylene glycol monoethyl ether, thiodiethylene glycol, or a combination thereof.
11. The aqueous coating formulation of claim 9, wherein said tanning agent is present in an amount of between about 0.5 and 10% of total solids.
12. An aqueous coating formulation containing solids, for enhancing image visualization and retention of inks, comprising:
- a) a cationic polymer or copolymer,
 - b) a fabric softener,
 - c) urea, and
 - d) ammonium oxalate.
13. The aqueous coating formulation of claim 12 further comprising a tanning agent, said tanning agent being either ethylene glycol monoethyl ether, thiodiethylene glycol, or a combination thereof.
14. An aqueous imbibing solution, for enhancing image visualization and retention of acid dye-based inks comprising:
- a) ammonium oxalate, and
 - b) urea.
15. The aqueous imbibing solution of claim 14, wherein said ammonium oxalate is present between about 30 and 40% of the total solids.
16. The aqueous imbibing solution of claim 14, wherein said urea is present between about 50 and 70% of the total solids.
17. A method of treating a substrate so as to improve the adhesion, colorfastness and washfastness of an acid dye-based ink jet ink printed onto the substrate, and which substrate will be exposed to a post-treatment step following printing, the method comprising the steps of:
- a) providing a substrate,

- b) treating the substrate with an aqueous coating formulation comprising a cationic polymer or copolymer, a fabric softener, urea, and ammonium oxalate.

18. The method of claim 17 wherein said aqueous coating formulation further includes a tanning agent.
19. The method of claim 17 wherein said tanning agent is selected from either ethylene glycol monoethyl ether, thiodiethylene glycol, or a combination thereof.
20. The method of claim 17 wherein said cationic polymer or copolymer is present in an amount between about 5 to 95% of the total solids.
21. The method of claim 17 wherein said fabric softener is present in an amount between about 5 to 20% of the total solids.
22. The method of claim 17 wherein the aqueous coating formulation further comprises a latex binder.
23. The method of claim 22 wherein said latex binder is present in an amount between about 0 to 80% of the total solids.
24. The method of claim 17 wherein the urea is present in an amount between about 2 and 5% of the total solids.
25. The method of claim 17 wherein the ammonium oxalate is present in an amount between about 5 and 10% of the total solids.
26. An article produced by the method of claim 17.
27. A method of treating a substrate so as to improve the adhesion, colorfastness and washfastness of an acid dye-based ink jet ink printed onto the substrate, which will be exposed to a post-treatment step following printing, the method comprising the steps of:
 - a) providing a substrate,

- b) treating the substrate with an aqueous coating formulation comprising a cationic polymer or copolymer, and a fabric softener,
- c) treating the substrate of step b) with an aqueous imbibing solution of urea, and ammonium oxalate.

28. A method of producing a printed substrate so as to improve the adhesion, colorfastness and washfastness of an acid dye-based ink jet ink printed onto the substrate, the method comprising the steps of:

- a) providing a substrate,
- b) treating the substrate with an aqueous coating formulation comprising a cationic polymer or copolymer, a fabric softener, urea, and ammonium oxalate,
- c) drying the substrate,
- d) printing on the substrate with an acid dye-based ink,
- e) post-treating the printed substrate of step d).

29. The method of claim 28 wherein the aqueous coating formulation includes a tanning agent.

30. A printed substrate produced in accordance with the method of claim 28.

31. An aqueous coating formulation containing solids, for enhancing image visualization and retention of inks, comprising:

- a) a cationic polymer or copolymer,
- b) a fabric softener,
- c) urea, and
- d) ammonium salts of multifunctional weak acids, selected from the group consisting of ammonium oxalate and ammonium tartrate.

32. The aqueous coating formulation of claim 31 further comprising a tanning agent.

33. The aqueous coating formulation of claim 32, said tanning agent being either ethylene glycol monoethyl ether, thiodiethylene glycol, or a combination thereof.

34. An aqueous imbibing solution, for enhancing image visualization and retention of acid dye-based inks comprising:

- a) ammonium salts of multifunctional weak acids, selected from the group consisting of ammonium oxalate and ammonium tartrate, and
- b) urea.

35. A method of treating a substrate so as to improve the adhesion, colorfastness and washfastness of an acid dye-based ink jet ink printed onto the substrate, which will be exposed to a post-treatment step following printing, the method comprising the steps of:

- a) providing a substrate,
- b) treating the substrate with an aqueous coating formulation comprising a cationic polymer or copolymer, and a fabric softener,
- c) treating the substrate of step b) with an aqueous imbibing solution of urea, and ammonium salts of multifunctional weak acids, selected from the group consisting of ammonium oxalate and ammonium tartrate.

36. A method of treating a substrate so as to improve the adhesion, colorfastness and washfastness of an acid dye-based ink jet ink printed onto the substrate, and which substrate will be exposed to a post-treatment step following printing, the method comprising the steps of:

- a) providing a substrate,
- b) treating the substrate with an aqueous coating formulation comprising a cationic polymer or copolymer, a fabric softener, urea, and ammonium salts of multifunctional weak acids, selected from the group consisting of ammonium oxalate and ammonium tartrate.